

REMARKS

Claims 1, 3, 4, 7, 11, 13-15, 20, and 22 are pending in the above-identified application. Of these, Claims 14, 15, and 22 have been canceled, Claims 1, 3, 4, 7, 11, 13 and 20 have been amended, and Claim 23 has been added, leaving Claims 1, 3, 4, 7, 11, 13-15, 20, and 23 for consideration upon entry of this amendment.

Objections to Claims

Claim 22 is objected to for failing to further limit the subject matter of the claim from which it depends. Applicants have canceled Claim 22 without prejudice. Reconsideration and withdrawal of the objection is respectfully requested.

Amendments to Claims

Claim 1 has been amended to recite “swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst”, “the acrylic-silicone hybrid rubber core having a Latex InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core”, “the glass transition temperature of the acrylic-silicone hybrid rubber core is -120 °C to 25 °C” and “cyclic organosiloxane precursor comprising an organosiloxane cross-linking agent and an organosiloxane graft-linking agent”. Support for the glass transition temperature limitation is found in Claim 14, canceled herewith, and that of the “disposition of the discrete polyorganosiloxanes rubber phase dispersed locally...” is found in Claim 15, also canceled herewith. The limitation of the morphology and the glass transition temperature by swelling and condensing reaction is further supported by Examples 1, 6 to 9 of the instant Specification.

Claim 3 has been amended to recite “(A)-(i) acrylic seed latex comprises.”

Claim 4 has been amended to recite “(A)-(ii) acrylic seed latex comprises,” to remove the terms “alkyl acrylate” and “alkyl methacrylate” to properly recite the markush group, and to include crosslinking monomers. Support for these limitations can be found at least in Claim 11 as originally filed, and in the Specification at least on p. 7, lines 16-23.

Claim 7 has been amended to recite (B)-(i)-(a)-alkyl acrylate having an alkyl group of 1 to 8 carbon atoms.

Claim 11 has been amended to recite ~~(A) (iii) cross-linking monomer and (B) (i) (b)~~ cross-linking monomer.

Claim 13 has been narrowed to recite only limitations to the aiding monomer.

Claims 3, 4, 7, and 11 have each been amended to remove the unnecessary term "kinds of."

Claims 1, 3, 4, 7, 11, 13, and 20 have each been amended to clarify the subject matter of the claims by amending to include a more descriptive preamble.

New Claim

Claim 23 has been added to further claim the invention, by claiming a specific composition of the cyclic organosiloxane precursor in Claim 1. Further support for these amendments can be found in the Specification as filed in Examples 1-27 and in Tables 1-5.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1, 3, 4, 7, 13-15, 20, and 22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner has rejected Claims 1 and 22 for not specifying what the compositional ranges are based on. Claim 1 has accordingly been rewritten to clarify the compositional basis for the components, and Claim 22 has been canceled without prejudice, as noted above. Reconsideration and withdrawal of the rejections are respectfully requested.

Claim 4 is rejected as indefinite for not clarifying whether the claim is to be restricted to the specific alkyl acrylates and alkyl methacrylates listed. Claim 4 has accordingly been amended to remove the terms "alkyl acrylate" and "alkyl methacrylate" and to recite only the specific compounds (e.g., ethyl acrylate, butyl acrylate, etc.) listed in the claim. Claim 4, so amended, should now be acceptable to the Examiner. Reconsideration and withdrawal of the rejection is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3, 4, 7, 9-15 and 20 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over International Patent Application Publication WO 2004/58839 (“Ahn”) in view of U.S. Patent No. 5,804,655 (“Miyatake”). Applicants respectfully traverse this rejection.

Ahn discloses an impact modifier having (a) 0.5 to 40 parts by weight (pbw, based on total composition) of a seed including (i) 65 to 99.4 pbw of vinyl monomers, (ii) 0.35 to 30 pbw of hydrophilic monomer, and (iii) 0.1 to 5 pbw crosslinker; (b) 50 to 89.5 pbw (based on total composition) of rubbery core surrounding the seed, and comprising (i) 95.0 to 99.9 pbw C₂₋₈ alkyl acrylate or diene and (ii) 0.1 to 5 pbw crosslinker, based on core monomers; and (c) 10.0 to 49.5 pbw (based on total composition) of shell surrounding the rubbery core and comprising (i) 95.0 to 99.9 pbw C₁₋₄ alkyl methacrylate and (ii) 0.1 to 5 pbw crosslinker, based on shell monomers. Ahn, p. 3, lines 1-18. In the seed, the vinyl monomer may be styrene, the hydrophilic monomer may be acrylonitrile, and the crosslinker, divinylbenzene. Ahn, p. 8, lines 7-22. In the core, the C₂₋₈ acrylate may be butyl acrylate, and the crosslinker may be 3-butanedioldiacrylate. Ahn, p. 9, line 1 to p. 11, line 1. The shell may include methyl methacrylate and small amounts of other monomers to enhance compatibility with a polycarbonate matrix. Ahn, p. 12, lines 12-18.

Miyatake discloses a silicone-modified acrylic rubber particle prepared by graft polymerizing 45-5,000 pbw of siloxane rubber (B) onto 100 pbw acrylic rubber particles (A), and further grafting onto the combination of (A) and (B) 0.1 to 5,000 pbw of an acrylic shell (C). Miyatake, Abstract; Col. 3 line 26 to Col. 4, line 18. The acrylic rubber particles (A) comprise 65-99.9% C₁₋₁₂ alkyl acrylate (A1) including butyl acrylate, and 0-5% crosslinker. Col. 5, lines 11-33, Col. 5, line 61 to Col. 6, line 12. The siloxane rubber (B) comprises 80-99.9% of hexamethylcyclotrisiloxane, 0.1-10 % crosslinker including tetramethoxysilane, and 0-10 % graft-linking agent including beta-methacryloxyethyl dimethoxymethylsilane. Col. 6, lines 35-67; Col. 9, line 25 to Co. 10, line 6.

As required in Chapter 2143.03 of the M.P.E.P, in order to “establish *prima facie* obviousness of the claimed invention, all the limitations must be taught or suggested by the prior art.” The Applicants submit that neither Ahn nor Miyatake either singularly or in combination, teach or suggest each and every element recited in the amended claim 1. In particular, amended claim 1 recites, *inter alia*, an **“acrylic-silicone hybrid rubber core by swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst”, “the acrylic-silicone hybrid rubber core having a Latex**

InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core”, “the glass transition temperature of the acrylic-silicone hybrid rubber core is -120 °C to 25 °C” and “cyclic organosiloxane precursor comprising an organosiloxane cross-linking agent and an organosiloxane graft-linking agent”. None of the references, either singularly or in combination, disclose these features for the following reasons.

First, neither Ahn nor Miyatake teach or suggest “acrylic-silicone hybrid rubber core by swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst.” As the Examiner has noted previously, Miyatake discloses only a graft polymerization between acrylic rubber and silicone rubber to silicone-modify for acrylic rubber core (See Miyatake, claims 1, 9, and Examples). Ahn discloses only an acrylic rubber core without silicone rubber.

Because the chemical arts are not necessarily readily predicted from a single type of prior art compound, one of ordinary skill in the art may not reasonably infer, in this instance, that structurally/chemically similar species (for example, silicone precursors) when included in different reactions (for example, in graft polymerization of silicone rubber, or alternatively, swelling of a silicone precursor and then condensing under an acid catalyst) would necessarily have similar properties. See, e.g., *In re May*, 574 F.2d 1082, 1094, 197 USPQ 601,611 (CCPA 1978).

Furthermore, according to M.P.E.P. § 2133.08, “When a single proper art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus, Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious.” Ahn and Miyatake are silent with respect swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst. In fact, neither Ahn nor Miyatake disclose using silicone precursor for a swelling and condensing under the acidic catalyst.

Second, neither Ahn nor Miyatake teach or suggest a combination of “the acrylic-silicone hybrid rubber core having a Latex InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core” and “the glass transition temperature of the acrylic-silicone

hybrid rubber core is -120°C to 25 °C.” As the Examiner has noted previously, Miyatake discloses only a graft polymerization between acrylic rubber and silicone rubber to silicone-modify for acrylic rubber core (See Miyatake, Claims 1, 9, and Examples) and Ahn discloses only an acrylic rubber core without silicone rubber.

One of ordinary skill in the art would not reasonably expect that structurally/chemically similar species (for example, silicone precursors), when subject to different reaction conditions (for example, graft polymerization of silicone rubber, or swelling of silicone precursor and then condensing under the acid catalyst) would have similar resulting properties. See, e.g., *In re May*, 574 F.2d 1082, 1094, 197 USPQ 601,611 (CCPA 1978). Furthermore, according to M.P.E.P. § 2133.08, “When a single proper art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus, Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious.” Ahn and Miyatake are silent with respect to a combination of “the acrylic-silicone hybrid rubber core having a Latex InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core” and “the glass transition temperature of the acrylic-silicone hybrid rubber core is -120°C to 25 °C.”

According to Miyatake, monomer (A-3), having polymerizable unsaturated bonds and a reactive silyl group (Col. 5, lines 21-24) of the composition for forming acrylic rubber acts as a graft active point for forming the silicone rubber (B) (Col. 6, lines 28-34), where (A-3) may be the same monomer as (B-3) for forming the silicone rubber (B) (See Miyatake, Col. 9, lines 58 to 67). The amount of (A-3) is 0.1 to 10 weight % and the amount of (B-3) is 0 to 10 weight %. See also Miyatake, Col. 5, lines 7-10 and 21-24; Claims 1 to 9; and Examples.

Claim 1 does not claim that the acrylic rubber core acts as a graft active point as in (A-3) of Miyatake; in (B)(i) in amended claim 1, the discrete polyorganosiloxane rubber phase is dispersed locally onto an inner part and surface of the continuous acrylic rubber core by a Latex Interpenetrating Network morphology where no graft is required, unlike the core of Miyatake.

Specifically, Claim 1 does not claim a monomer (A-3), and includes cyclic organosiloxane precursors instead of monomer (B-3), and thus comprises an organosiloxane cross-linking agent and an organosiloxane graft-linking agent only in the form of a cyclic

organosiloxane precursor, and not as a bifunctional unsaturated-reactive silyl monomer linking the acryl rubber core to the silicone rubber as disclosed in Miyatake.

Finally, a combination of “acrylic-silicone hybrid rubber core by swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst”, “the acrylic-silicone hybrid rubber core having a Latex InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core”, “the glass transition temperature of the acrylic-silicone hybrid rubber core is -120°C to 25°C ” and “cyclic organosiloxane precursor comprising an organosiloxane cross-linking agent and an organosiloxane graft-linking agent” are not obvious over the combined teaching of Ahn and Miyatake because the instantly claimed acryl-silicon hybrid impact modifier yields unexpected and superior results.

The courts have held that “[m]ere duplication of parts has no patentable significance unless new and unexpected result is produced.” *In re Harza*, 124 USPQ 378 (CCPA 1960), emphasis added. Applicants’ have demonstrated that new and unexpected results were obtained in Examples 5 to 19, as discussed in the specification. These examples show that vinyl chloride resin with improved impact resistance and coloring property etc., can be obtained using only a combination of “acrylic-silicone hybrid rubber core by swelling a cyclic organosiloxane precursor in the acryl rubber core, and then condensing the swells under an acidic catalyst”, “the acrylic-silicone hybrid rubber core having a Latex InterPenetrating Network (LIPN) morphology in which a discrete polyorganosiloxane rubber phase is dispersed locally onto the inner part and surface of a continuous acrylic rubber core”, “the glass transition temperature of the acrylic-silicone hybrid rubber core is -120°C to 25°C ” and “cyclic organosiloxane precursor comprising an organosiloxane cross-linking agent and an organosiloxane graft-linking agent”. One skilled in the art would not reasonably expect the combination of these elements to provide the unexpected results obtained in Examples 5-19, based on the impact modifiers of Examples 1-4, and hence the combination of elements is not obvious over the combined teachings of Ahn and Miyatake.

As argued extensively in the prior response, a comparison of the closest cited art with the invention as disclosed and claimed in the instant claims fails to provide a suggestion of the unexpected and apparently synergistic improvement in NII at 0°C (before and after aging) for the invention claimed in Claim 1. In no way does the combination of Ahn and Miyatake teach or suggest such an improvement in NII, with or without aging. The combination of Ahn and

Miyatake therefore does not suggest the unexpected benefits of the instantly claimed impact modifier.

For these reasons at least, Ahn in view of Miyatake fails to disclose the combination of limitations claimed in Claim 1, and therefore does not disclose all elements of the instant claims. Furthermore, there is no suggestion or incentive that would lead one skilled in the art to modify Ahn with the limitations of Miyatake, as the combination fails to suggest the unexpected and large (>100%) improvement in low temperature NII before and after aging as seen in the examples, for compositions as claimed in Claim 1. Therefore, Claim 1 and its dependent claims are not unpatentable over Ahn in view of Miyatake.

Conclusion

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

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